

reviewed and amended as suggested in the Office Action and are now believed to comply with the requirements of 35 U.S.C. § 112.

Paragraphs 23-28 of the Office Action appear to be rejections based on the Unix operating system. Paragraph 23 of the Office Action states that claim 1 reads on Unix because Unix discloses the use of known permission levels among files and processes running under its operating system. The Office Action further states it is a matter of common knowledge that an apparatus (Unix and hardware) was implemented for communication between the plurality of processor devices. Here the Office Action refers to application programs and states that such a device would include a post office memory with a plurality of mailbox memories with each of the mailbox memories being write accessible only by its owner processor device and read accessible by its owner and other processor devices. The Office Action further identifies what appear to be various Unix commands, but provides no documentation relating the commands either to the Office Action or to the claims at issue. Merely referencing the Unix operating system or commands of the Unix operating system without providing some documentation of the reference makes the rejection, if it is a rejection, totally unclear and prejudices the applicants in attempting to formulate a response. For example, there is no way for the applicants to know which version of Unix is being applied against the claims. Further, the claims are drawn to an apparatus or to a method of communicating as applied to an apparatus, while Unix is understood to be a software operating system. Thus, it is not clear from the Office Action how Unix is being applied to the implementation recited in the present claims. For the reasons discussed above, withdrawal of any rejections based on Unix is respectfully requested.

Claims 1-8, 13, 14 and 16-23 are rejected as anticipated by Burkhardt. Claims 1-23 are further rejected as unpatentable over Burkhardt. In particular, the Office Action states with respect to claims 9-12 and 15 that, although Burkhardt does not

detail the use of a multiport RAM as recited in the claims, the use of such a RAM would be obvious as a replacement of the serial manner of the work station bus in Burkhardt. According to the Office Action, the parallel fashion of such a RAM would provide faster operation of the system over the serial access of that used by the reference.

The present invention provides for asynchronous data transfer between processor devices. The data transfer is accomplished by a system in which a processor can write data to a dedicated mailbox thereby avoiding write time latency. Each processor has read access to all of the mailboxes, such that a processor can retrieve data addressed to it when the processor is ready. Thus, using the architecture recited in the present claims, a processor can write data at a first rate and read data at a second rate or different processors can operate at different rates. Claims 1 and 13 have been amended to recite the feature that the receiving processor determines the time that it reads the information.

Burkhardt discloses an array of mailbox locations associated with processors. A processor desiring to send a message to another processor inserts the message into its mailbox along with the address of the other processor. The sending processor then interrupts the receiving processor. In response to the interrupt, the receiving processor scans the mailboxes to find the mailbox with its address so that it can receive the message.

Burkhardt is discussed beginning at page 1, line 27 - page 2, line 9 of the instant specification. Two important disadvantages of Burkhardt are noted therein. First, in Burkhardt each of the processors acts as a common memory via a common work station bus. Thus, overhead is required to deal with bus contention and collision. Unlike the present invention, Burkhardt does not provide a system in which each of the mailbox memories is write accessible by its owner processor device at any time. As previously noted, claim 1 and claim 13 have been

amended to more clearly recite this feature of the present invention.

A second disadvantage of Burkhardt, as noted in the instant specification, is that in Burkhardt communication taps may be tied up unless processors copy and clear mailbox information quickly. Indeed, column 17, lines 31-33 of Burkhardt disclose that a recipient agent must empty a mailbox containing its address as quickly as possible so as to release the mailbox for further use by the originator. The need for quickly emptying a mailbox is inherent in the structure of Burkhardt and is a limitation avoided by the invention recited in the present claims. In particular, at column 10, line 51 - column 11, line 49 Burkhardt discloses that a processor is assigned two mailboxes at a predefined address in memory accessible to all of the processors. An agent associated therewith transmits a wake-up interrupt accessible over the work station bus 27 which permits other agents to bring to its attention that it is the address of a message to be found in the sender's mailbox. The agent wishing to transmit a request to a different processor, however, writes an abbreviated form of the message into its mailbox and generates an interrupt request. The server at the receiver processor determines that a request is pending and scans the mailboxes to determine the source of the request. The server then copies the request into the memory space of its processor and releases the mailbox entry by clearing the address field. The server then creates a response message in its mailbox and sends an interrupt to the requesting agent informing it that the requested operation has been completed.

This series of complex steps disclosed in Burkhardt is simply not required in the apparatus recited in the present claims. Claim 1 specifically recites that each of the mailbox memories is write accessible at any time by a corresponding owner processor device and read accessible by the corresponding owner processor device and other processor devices at times determined independently from a write access. Thus, unlike Burkhardt, the

Serial No. 08/113,299

present invention provides a system in which the server need not scan the mailboxes to determine the source of the request; nor must the server clear the mailbox quickly in order to allow the requesting device further access to its mailbox. In Burkhardt, the appropriate response to the interrupt request from the device which has written to its memory is for the receiving device to copy the request into its memory space, so that the transmitting mailbox can be released to accommodate other requests. In contrast, the present invention provides communication means such that a write access from the processor to its memory can occur at any time, while a read access occurs at some other time that is independently determined by the recipient device independent of the time of the write access. In particular, claims 7 and 8 both recite a signal line between the receiving processor device and each of the transmitting processor devices, with each of the signal lines setting the status of one of the transmitting processors in the mailbox that it is registered. Thus, the present invention does not rely on a contention bus structure, as disclosed in Burkhardt. Further, there is no basis in the Office Action for concluding that the claims, as amended, are read on by Unix.

In view of the above, it is submitted that the claims, as amended, are patentably distinguished over the references and are now in form for allowance. Early notification of same is earnestly solicited.

Respectfully submitted,

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